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ABSTRACT

University education in Alberta during the next two decades is addressed in relation to the increasing in-migration and uncertain participation. Although Alberta has the highest rate of net population gain among all provinces due to in-migration, it is not clear how many of the 18-24-year-old cohort will be job-seekers rather than potential university students. Three documents are presented that study the demographic and occupational demand trends and their potential impact on postsecondary enrollment in Canada and the Province of Alberta: "The Class of 2001," by W. Clark, M. S. Devereaux, and Z. Zsigmond; "Out of School--Into the Labour Force," by Z. Zsigmond, G. Picot, W. Clark, M. S. Devereaux; and "Summary of Canadian Occupational Forecast (COFOR) Model Results for Alberta, 1975-1982," by the Alberta Planning Secretariat. Focus is on demographics, postsecondary enrollment and participation rates, educational output and the labor force, and occupational demand in Alberta. Appendices summarize the reports examined. Figures and tables provide statistical data used for analysis. (LC)

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1979-05-03
Project 1369

Dr. P. J. Krueger
Vice-President (Academic)
The University of Calgary

Dear Dr. Krueger:

The enclosed report was prepared at your suggestion to provide background information to assist the Universities Coordinating Council in its consideration of the Statistics Canada document Out of School - Into the Labour Force and the Alberta Advanced Education and Manpower (AAEM) document Summary of Canadian Occupational Forecast (COFOR) Model Results for Alberta, 1975-1982. Since the Statistics Canada document The Class of 2001 has recently appeared and is clearly related, it is also included. The appendices of this report contain concise synopses of the three documents.

The body of this report draws information from a wider range of sources than the three documents, and attempts to provide a focused analysis from an Alberta university perspective. This report is organized around four major themes, including demographics, postsecondary enrolment and participation rates, educational output and the labour force and, finally, occupational demand in Alberta. The Executive Summary highlights what we see as the important Alberta ramifications of not only the material in the three documents, but other conclusions following out of the analysis in this report.

The most concise statement on demographics, enrolments and participation is perhaps contained in Figure 2, in which we present what we see as the logical alternatives for full-time university enrolment projections. In our estimation, the most likely alternative is one in which the total full-time enrolment at the four universities remains reasonably constant at about 30 000 students until about 1983, declines about 2 000 students, but begins to increase again in about 1987. Since full-time enrolment at Alberta universities in 1970 was 29 000, this projection would have university enrolment essentially unchanged over the twenty-year period from 1970 to 1990.

Among the most disturbing things to come out of the following analysis is the current sharply declining participation rate of full-time students as a percentage of the Alberta 18-24 year old population, and the continuingly low Alberta participation rate for part-time university enrolment.

Throughout this project, as has been the case over many years, Zoltan Zsigmond of Statistics Canada, the principal author of two of the documents, has been of great assistance to Shep Braun in the preparation of this report. We also owe a debt of gratitude to the staff of the Planning Secretariat and the Financial Planning Division of AAEM, and to Dr. Jack Reid, Director of Student Evaluation and Data Processing Services, Alberta Education, for their assistance in gathering some of the data presented in this report.

About five years ago, before the first Zsigmond/Statistics Canada document on the "roller-coaster curve" was published, Dr. Zsigmond conducted a seminar here at The University of Calgary to get reaction to his initial findings, and to get more specific Alberta input for sharpening regional variations in the national trends. Dr. Zsigmond feels that it would be valuable to have another such meeting with a representative group in Alberta to review some of the more technical aspects of the regional projections in The Class of 2001. I would suggest that the Universities Coordinating Council consider hosting such a meeting; the Office of Institutional Research would be happy to provide local arrangements.

For many years, AAEM and its predecessors provided a central focus for enrolment projections and related demographic study. From a technical perspective there is much to be said for close cooperation among the people at the institutions who annually work on these questions. We hope this document might stimulate the sort of discussion that will improve our understanding of the trends that are likely to impact the institutions over the next decade.

Yours sincerely,

Bernard S. Sheehan

Bernard S. Sheehan
Director

Alberta Demographics and the Universities

Prepared by:
Shepard Braun

Office of Institutional Research
The University of Calgary

May 1979

EXECUTIVE SUMMARY

The two most striking demographic features influencing university education in Alberta during the next two decades are increasing in-migration and uncertain participation.

Alberta has the highest rate of net population gain among all provinces due to in-migration; if this trend continues, the extent of the long anticipated decline among the 18-24 year old population (which represents 75% of the full-time university enrolment) will be approximately 11% from its 1983 peak and reaching its lowest point in the early 1990's with a recovery by the end of the century.

While Alberta in-migration will moderate the decline in the 18-24 year old population relative to the rest of Canada, it is not clear what consequences it will have for university enrolment. Newcomers in the 18-24 year old cohort represent approximately 21% of the total in-migration in a given year, but they still are only 2.6% of Alberta's total 18-24 year old population. If a majority of the 18-24 year old group migrating to Alberta represent job seekers rather than potential university students, then the participation rate may well experience further decline.

Despite increases in the 18-24 year old population in Alberta during the decades of the 1960's and 1970's, the university level full-time participation rate, i.e., university enrolment as a percent of the 18-24 year old population, has declined steadily from a high of 15.2% in 1970 to 11.0% in 1978. By comparison the national participation rate for full-time university enrolment has remained almost constant during the same period. The participation rate for part-time enrolment at the national level has exhibited a gradual increase, but the rate for Alberta has remained relatively constant and is the lowest among the provinces.

There is insufficient evidence to attribute the recent decline in the Alberta universities' participation rate to increased enrolment in the public colleges and technical institutes. Though full-time enrolment in the non-university sector has constantly increased during the last nine years with the exception of 1978, the participation rate in this sector has remained relatively constant. A factor which suggests continued

decline in university enrolments is the recent drop in the participation rate of a more select cohort--Alberta grade 12 matriculants. While the percentage of those qualifying for matriculation has remained fairly constant during the last six years, the participation rate in the freshman class of this cohort has declined substantially from 54.9% in 1974 to 39.7% in 1978.

Standard projection methodology and the best information currently available suggests that the present level of full-time university enrolment, approximately 31 000 students, will decline by no more than 9% over the next decade.

Occupational demand for those with university level training is forecast to increase substantially in Alberta over the next decade. Some of the occupational categories with the greatest projected rate of growth are those which presently have enrolment limitations, i.e., engineering, medicine, business and commerce, and geology.

Any analysis which attempts to relate Alberta occupational demand with university output is severely limited by the lack of information specifically linking job opportunities to educational requirements. While one can generally assume that unemployment will be lower among university degree recipients, this has not been uniformly true for all disciplines.

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Alberta Demographics and The Universities

Introduction

The following provides an analysis of the important features of three recent publications dealing with demographic and occupational demand trends and their potential impact on postsecondary enrolment in Canada and the Province of Alberta. The three documents examined in this report are:

The Class of 2001. W. Clark, M. S. Devereaux, and Z. Zsigmond, Statistics Canada, February 1979.

Out of School - Into the Labour Force. Z. Zsigmond, G. Picot, W. Clark, M. S. Devereaux, Statistics Canada, August 1978.

Summary of Canadian Occupational Forecast (COFOR) Model Results for Alberta, 1975-1982. Planning Secretariat, Alberta Advanced Education and Manpower, March 1976.

While the analysis examines trends and comparisons across Canada, the principle focus of this report is on the impact of population trends upon postsecondary enrolment in Alberta. The report is organized into four major themes dealing with:

1. demographics,
2. postsecondary enrolment and participation rates,
3. educational output and the labor force, and
4. occupational demand in Alberta.

Though this analysis is in part based on the information provided in the three above-mentioned documents, it also incorporates specific data on the Alberta postsecondary context from other sources.

Demographic Trends: 1976 to 1986 and Beyond

Alberta Population Trends

The Canada-wide population trends which are discussed in Appendix "A" of this document, while important for understanding the effects of the

population wave phenomenon, do not adequately describe the special features of Alberta demographic trends and their influence on university enrolment in the province. The effects of interprovincial migration and international immigration play a more important role in determining the population trends in the individual provinces.

Migration Trends

Alberta is in a unique position among the provinces as a result of recent in-migration trends. Net migration into Alberta (including both interprovincial and international) for all age groups since 1974-75 has consistently been the highest among the provinces. Interprovincial net migration of children 15 years of age and under during the same period in Alberta is substantially higher than that experienced in any other province. Tables I and II provide detailed comparisons between provinces illustrating the above points.

TABLE I

NET MIGRATION
(INTERPROVINCIAL AND INTERNATIONAL)
ALL AGES[1]

(Thousands)

YEAR	NEWFOUNDLAND	PRINCE EDWARD ISLAND	NOVA SCOTIA	NEW BRUNSWICK	QUEBEC	ONTARIO	MANITOBA	SASKATCHEWAN	ALBERTA	BRITISH COLUMBIA
1974-75	+ 0.7	+ 1.6	+ 5.6	+ 7.5	+ 4.1	+49.9	+ 2.3	+ 0.8	+32.2	+34.4
1975-76	+ 0.9	+ 0.8	+ 4.8	+ 7.9	- 1.0	+32.7	- 0.1	+ 6.8	+35.5	+11.3
1976-77	- 1.6	+ 1.1	+ 0.8	+ 3.2	- 9.6	+28.1	- 0.8	+ 7.2	+36.1	+ 9.5
1977-78	- 3.1	+ 0.9	+ 0.5	+ 1.5	-45.0	+29.7	- 4.6	+ 2.1	+34.0	+19.2

[1] The Class of 2001, p. 97.

TABLE II

NET INTERPROVINCIAL MIGRATION OF
CHILDREN 15 YEARS OF AGE AND UNDER[1]

YEAR	NEWFOUNDLAND	PRINCE EDWARD ISLAND	NOVA SCOTIA	NEW BRUNSWICK	QUEBEC	ONTARIO	MANITOBA	SASKATCHEWAN	ALBERTA	BRITISH COLUMBIA
1974-75	+ 236	+ 411	+ 667	+1 914	- 2 316	-19 012	-2 253	+ 544	+7 006	+3 838
1975-76	+ 210	+ 185	+ 913	+1 799	- 2 970	- 7 209	-1 927	+2 183	+7 979	-1 025
1976-77	- 907	+ 420	- 173	+ 355	- 6 546	- 1 965	-1 000	+1 907	+7 911	+ 447
1977-78	-1 181	+ 317	+ 79	+ 168	-12 354	+ 2 596	-2 157	+ 94	+8 114	+4 542

[1] The Class of 2001, p. 93.

When examining demographic trends at the national level, fertility assumptions impact the size of the various age groups to a much greater degree than international migration assumptions. At the provincial level however, due to a variety of social and economic factors, interprovincial migration assumptions become the dominant variable. This is especially true of projections for the 18-24 year old age group which are not influenced by fertility assumptions until the mid-1990's, that is, 18 years hence.

The Class of 2001 presents four different population projections for each province based on different assumptions about average annual net migration. The various assumptions which form the basis for each projection are illustrated in Table III. For Alberta, the difference between the highest and lowest projections for the 18-24 year old postsecondary age group, for example, in the year 1991, is 13.4% due to different migration assumptions.

TABLE III

FERTILITY RATE AND
NET MIGRATION ASSUMPTIONS FOR
ALBERTA POPULATION PROJECTIONS[1]

PROJECTION	TOTAL FERTILITY RATE[2] 1976	1991	NET IN-MIGRATION[3] (FIVE YEAR AVERAGES) 1976-81	1981-86	1986-91
1	2.1	2.1	28 900	11 500	9 900
2	2.1	2.1	37 800	39 700	39 000
3	2.0	1.8	31 100	20 800	18 500
4	2.0	1.8	33 100	29 600	26 400

[1] The Class of 2001, p. 105.

[2] Fertility rate represents the average number of children expected to be born to a woman throughout her life.

[3] Net in-migration represents the combined result of international and interprovincial in- and out-migration.

Impact of Migration on Different Age Group Population

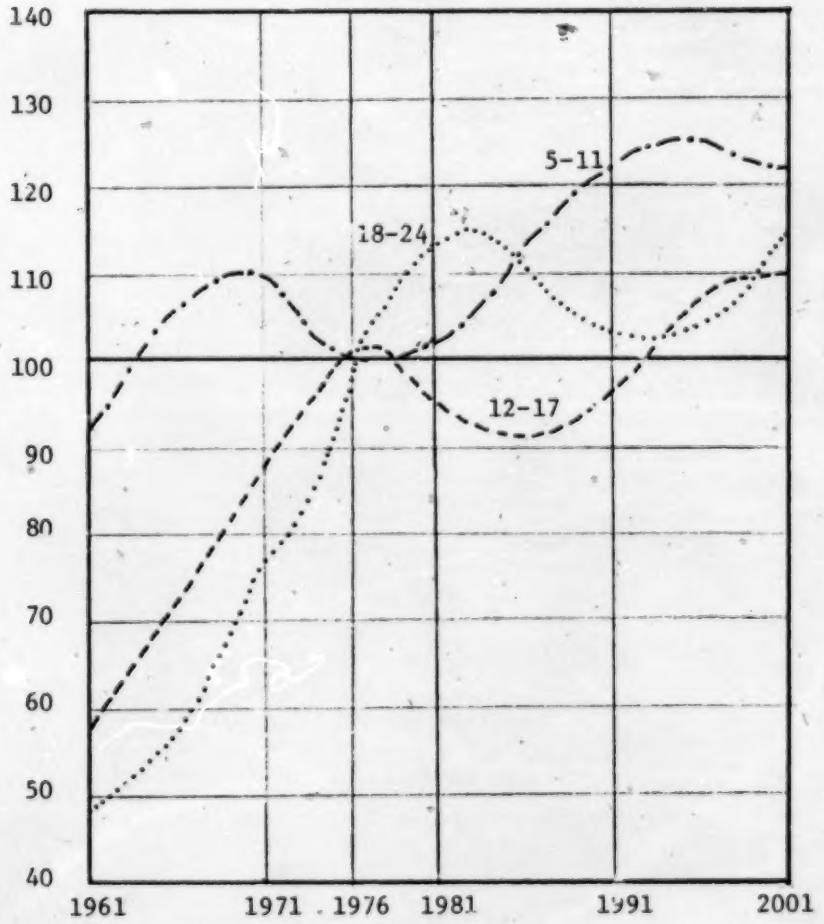
To illustrate the impact of in-migration on the demographics for Alberta, it is helpful to examine the population projections presented in The Class of 2001 for three different school age groups 5-11 year olds (elementary), 12-17 year olds (secondary) and 18-24 year olds (postsecondary), based on the fertility rate and net migration assumptions shown for projection number three in Table III. The graph in Figure 1 shows the trends for the three age groups indexed to 1976 which was the year for the highest

Figure 1

COMPARISON OF TRENDS IN SCHOOL-AGE POPULATION[1]

(Indexed to 1976 = 100)

ALBERTA



[1] The Class of 2001, p.61

full-time enrolment in Alberta universities. The 18-24 year old population in Alberta will peak in the early 1980's and then decline to its lowest point in 1992, followed by a steady upturn; at its lowest point, this age group will remain above the level reached in 1976. Therefore further decline in university enrolments can be explained only by a continued decline in the participation rate. The 5-11 year old age group reaches its lowest point in 1977 and steadily increases during the 1980's and early 1990's with a slight decline thereafter. Only the 12-17 year old age group declines below its 1976 level during the projected period and does not subsequently move above that level until the early 1990's.

Based primarily on the projections for the 18-24 year old age group in Alberta, the outlook for university level enrolment would appear more promising than that of other provinces which are projected to experience a more drastic decline in the 18-24 year old population.

Postsecondary Enrolment and Participation Rates

Participation Rates -- Canada and the Provinces

Optimism for Alberta postsecondary enrolment, especially at the university level, based solely on demographic projections must be tempered by recent developments in the participation rate. Despite increases in the 18-24 year old population in Alberta during the decades of the 1960's and 1970's, the university level participation rate among this age group has declined steadily from a high of 15.2% in 1970 to 11.0% in 1978. By comparison, the national participation rate for full-time university level enrolment exhibits a gradual but steady increase for the same period with a slight decline in the last few years. Tables IV and V provide a breakdown of participation rates for the provinces and Canada by full-time and part-time university enrolment.

TABLE IV

FULL-TIME UNIVERSITY ENROLMENT[1]
PARTICIPATION RATES 18-24 YEAR OLD POPULATION
SELECTED YEARS[2]

PROVINCE	1962	1964	1966	1968	1970	1972	1974	1975	1976	1977	1978[3]
Newfoundland	4.2	5.2	7.0	7.7	9.6	10.5	8.2	8.3	8.7	8.7	7.7
Prince Edward Island	7.5	8.4	10.4	12.4	13.3	11.5	9.5	10.1	10.0	9.8	9.4
Nova Scotia	9.1	10.6	11.8	13.1	16.1	16.1	16.2	16.8	16.7	16.3	16.0
New Brunswick	8.4	9.5	10.1	11.8	13.1	12.2	12.0	12.2	11.8	11.6	11.1
Quebec	8.3	9.5	10.8	8.6	7.9	8.3	8.5	9.1	9.0	9.2	9.4
Ontario	7.0	8.1	9.4	11.4	13.2	14.0	14.8	15.3	15.4	14.6	14.2
Manitoba	8.8	9.8	12.1	13.7	14.0	13.8	13.7	14.3	13.7	13.2	12.8
Saskatchewan	8.3	10.7	11.9	13.2	13.7	12.4	12.1	12.4	12.1	11.6	11.2
Alberta	7.4	8.9	10.5	13.6	15.2	13.3	13.0	13.0	12.4	11.8	11.0
British Columbia	11.0	11.4	12.8	13.3	12.3	10.0	10.0	10.3	10.1	9.7	9.3
CANADA	8.0	9.1	10.5	11.0	11.7	11.7	11.9	12.4	12.3	11.9	11.4

[1] Excluding non-university level programs at universities.

[2] Education in Canada (Ottawa: Statistics Canada, 1975 and 1976); Universities: Enrolment and Degrees (Ottawa: Statistics Canada, 1977) and Advance Statistics of Education (Ottawa: Statistics Canada, 1979-80).

[3] Participation rates for 1978 are based on Statistics Canada preliminary estimates of enrolment.

TABLE V

PART-TIME UNIVERSITY ENROLMENT
PARTICIPATION RATES 18-24 YEAR OLD POPULATION
SELECTED YEARS[1]

PROVINCE	1962	1964	1966	1968	1970	1972	1974	1975	1976	1977	1978[2]
Newfoundland	0.4	0.8	1.6	2.0	4.3	5.0	4.8	4.4	4.3	4.3	4.0
Prince Edward Island	2.1	2.3	3.8	3.5	8.1	6.7	5.7	6.1	5.8	5.1	4.9
Nova Scotia	1.8	1.9	2.2	2.9	3.0	3.6	5.2	5.4	5.6	5.7	5.7
New Brunswick	2.4	2.7	5.0	5.0	5.9	5.8	5.9	6.1	4.8	4.7	4.2
Quebec	3.4	4.8	5.5	5.1	8.2	6.6	6.6	7.1	7.6	8.9	8.6
Ontario	2.4	3.2	3.8	4.6	6.3	6.4	6.8	7.2	6.9	7.3	7.2
Manitoba	2.3	2.2	2.6	5.1	6.3	6.8	7.7	8.1	8.9	8.9	8.0
Saskatchewan	1.4	2.2	2.7	2.8	3.0	3.7	5.9	6.1	6.3	6.3	6.0
Alberta	1.7	2.4	2.6	3.2	3.7	3.8	3.5	3.6	3.3	3.3	3.4
British Columbia	1.5	1.5	1.6	1.8	1.5	1.6	2.6	3.0	3.2	3.4	3.7
CANADA	2.5	3.3	3.9	4.2	5.9	5.9	5.9	6.2	6.3	6.8	6.6

[1] Education in Canada (Ottawa: Statistics Canada, 1975 and 1976); Universities: Enrolment and Degrees (Ottawa: Statistics Canada, 1977) and Advance Statistics of Education (Ottawa: Statistics Canada, 1979-80).

[2] Participation rates for 1978 are based on Statistics Canada preliminary estimates of enrolment.

Profile of Alberta Postsecondary Participation Rates

Full-time university enrolment in Alberta reached its peak in 1976 at 32 366 full-time students followed by declines in 1977 and 1978. Also, by 1977 the participation rate for full-time university enrolment had returned to the 1967 level of 11.7% with further erosion in 1978.

One might assume that the decline in the participation rate at the university level is a direct result of growth in the public colleges and technical institutes. The data do no suggest such a simple analysis. The participation rate for the total system declined from a peak of 20.5% in 1970 to 17.7% in 1978. However, during most of the decade of the 1970's the Alberta postsecondary system grew in absolute numbers. The participation rate in the non-university sector remained relatively constant while the rate for the university sector steadily declined. Table VI provides a detailed breakdown of the historical trends in participation rates for both the university and non-university sectors of the Alberta postsecondary system.

Enrolments -- Alberta Universities

University full-time enrolment in Alberta rose sharply between 1967 and 1970, increasing by approximately 55%; by contrast the growth during the period from 1970 to 1976 represented only a 12% increase, most of which came between 1974 and 1975. During 1977 and 1978, full-time enrolments declined 5% below the 1976 peak at 32 366. The relatively constant participation rate experienced by the non-university sector since 1972 represents a steady growth paralleling the increase in the 18-24 year old population. In fact, only in 1978 did the public colleges and technical institutes experience an actual decline in total full-time enrolments.

While it is obvious that in-migration will moderate the projected decline in the 18-24 year old population, it is not clear that in-migration will have a similar effect on the postsecondary system, especially the university sector. It is important to note that while 18-24 year olds represent approximately 21% of the total net in-migration in a given year in Alberta, the same cohort represents a relatively insignificant 2.6% of

TABLE VI

FULL-TIME ENROLMENTS IN ALBERTA POSTSECONDARY INSTITUTIONS SELECTED YEARS

INSTITUTION	1967	1970	1971	1972	1973	1974	1975	1976	1977	1978
UNIVERSITIES										
The University of Alberta	13 027	18 337	18 243	17 757	18 524	19 155	19 736	20 019	19 491	18 764
The University of Calgary	4 980	9 237	9 173	8 780	9 278	9 578	10 950	10 864	10 805	10 644
The University of Lethbridge	638	1 409	1 218	1 076	1 086	1 154	1 336	1 483	1 531	1 439
Athabasca University	-	-	-	-	-	-	-	-	53	82
TOTAL UNIVERSITIES	18 645	28 983	28 634	27 613	28 888	29 887	32 022	32 366	31 880	30 929
Percent of 18-24 Population	11.7	14.9	14.2	13.3	13.2	12.9	13.0	12.3	11.7	11.0
PUBLIC COLLEGES										
Fairview College	122	131	83	90	80	106	194	202[1]	210	262
Grande Prairie Regional College	107	242	336	309	340	369	514	640	652	601
Grant MacEwan Community College	-	-	410	999	1 198	1 257	1 624[1]	1 729[1]	2 048	1 772
Keyano College	-	-	-	-	-	-	156[1]	173[1]	191	211
Lakeland College	147	160	165	142	171	184	155	389	323	351
Lethbridge Community College	455	843	955	990	944	960	960	1 213	1 348	1 433
Medicine Hat College	199	410	442	339	371	410	374	419	590	558
Mount Royal College	1 555	1 728	1 892	2 305	2 467	2 405	2 759	2 559	2 702	2 621
Olds College	271	355	403	462	512	551	505	491	581	579
Red Deer College	225	879	779	665	723	930	1 002	1 223	1 185	1 193
TOTAL PUBLIC COLLEGES	3 081	4 748	5 465	6 301	6 806	7 172	8 243	9 038	9 830	9 581
Percent of 18-24 Population	1.9	2.4	2.7	3.0	3.1	3.1	3.3	3.4	3.6	3.4
TECHNICAL INSTITUTES[2]										
Northern Alberta Institute of Technology	2 619	3 490	3 661	4 088	4 367	4 176	4 293	4 497	4 611	4 738[3]
Southern Alberta Institute of Technology	2 154	2 664	2 970	3 409	3 827	3 876	4 113	4 408	4 933	4 698
TOTAL TECHNICAL INSTITUTES	4 773	6 154	6 631	7 497	8 194	8 052	8 406	8 905	9 544	9 436
Percent of 18-24 Population	3.0	3.2	3.4	3.6	3.8	3.5	3.4	3.4	3.5	3.4
TOTAL SYSTEM	26 499	38 885	40 730	41 411	43 888	45 111	48 671	50 309	51 254	49 946
Percent of 18-24 Population	16.6	20.5	20.1	19.9	20.1	19.5	19.7	19.2	18.8	17.7

[1] Estimated.

[2] Excludes apprenticeship programs.

[3] 1978 enrolment for Northern Alberta Institute of Technology is an estimate.

NOTES: (1) The rates for the university sector will differ slightly from those presented in Table IV due to a slightly different statistical basis.

(2) 18-24 year old population basis for participation rates is meaningful only as a constant for comparison with population.

SOURCE: Data collected by The University of Calgary, Office of Institutional Research from various governmental and institutional sources.

the total Alberta 18-24 year old population. If a majority of those individuals in the 18-24 age group migrating to Alberta represent job seekers rather than potential university students, then it is quite possible that both the level of university enrolments and the participation rate will experience further erosion.

An index of potential university enrolment is the participation rate based on the total number of secondary school Grade 12 leavers. Table VII shows the historical relationship between full-time freshman enrolment in universities and Alberta Grade 12 students in the previous year. The decline in the university participation rate for the Grade 12 cohort follows much the same pattern as that exhibited by the total full-time university enrolment when compared to the 18-24 year old population shown in Table VI. Both participation rates declined gradually during the period from 1970 to 1975 with a much steeper decline experienced in the last three years. By contrast, the participation rate of Alberta 17 year olds in Grade 12 has remained relatively constant over the last five years at approximately 82%.

TABLE VII

FULL-TIME FRESHMEN[1]
ALBERTA UNIVERSITIES PARTICIPATION RATE
BASED ON ALBERTA GRADE 12

YEAR	TOTAL FRESHMEN[2]	ALBERTA GRADE 12 (PREVIOUS YEAR)	PARTICIPATION RATE
1970	5 987	27 138	22.1
1971	5 445	28 793	18.9
1972	4 909	30 009	16.4
1973	5 535	29 599	18.7
1974	5 719	29 676	19.3
1975	6 034	30 868	19.5
1976	5 222	30 920	16.9
1977	4 903	31 029	15.8
1978	4 640	31 681	14.6

[1]Office of Institutional Research, The University of Calgary based on data supplied by Alberta Advanced Education and Manpower.

[2]Freshmen are defined as students who have not previously attended any postsecondary institution.

A more detailed look at the Grade 12 population suggests that the reason for a potential decline in university enrolments is the recent drop in the participation rate of a more select cohort. Table VIII shows the relationship between the total Alberta Grade 12 cohort and the members of that group who qualify for matriculation in Alberta universities. While the percentage of those qualifying for matriculation has remained realtively constant during the last six years, the participation rate of this cohort has declined substantially from 54.9% in 1974 to 39.7% in 1978.

Data are not currently available from the public colleges and technical institutes on the proportion of their total enrolment composed of students who having completed Alberta Grade 12 qualify for university matriculation. If the number of students qualifying for university matriculation but subsequently enrolling in the non-university sector has grown disproportionately, then a case could be made for arguing that part of the decline in the university level participation rate is a direct result of growth in the non-university sector. It is also possible that a greater number of individuals with previous university level degrees are opting for additional training in the technical institutues rather than pursuing after-degree programs at the universities.

TABLE VIII

ALBERTA UNIVERSITIES
FULL-TIME FRESHMEN[1]
PARTICIPATION RATE

YEAR	ALBERTA GRADE 12 PREVIOUS YEAR TOTAL	ALBERTA GRADE 12 PREVIOUS YEAR MATRICULANTS	MATRICULANTS AS A PERCENT OF TOTAL GRADE 12	TOTAL FRESHMEN	FRESHMEN AS A PERCENT OF GRADE 12 MATRICULANTS
1973	29 599	11 172	37.7	5 535	49.5
1974	29 676	10 422	35.1	5 719	54.9
1975	30 868	11 475	37.2	6 034	52.6
1976	30 920	11 493	37.2	5 222	45.4
1977	31 029	11 927	38.4	4 903	41.1
1978	31 681	11 689	36.9	4 640	39.7

[1]Office of Institutional Research, The University of Calgary based on data supplied by Alberta Advanced Education and Manpower.

An additional factor which clouds the picture with respect to potential university enrolment is the fact that there is a significant difference between the projections provided by Statistics Canada for different school-age groups in Alberta as shown in Figure 1, and those of the Alberta Bureau of Statistics in Table IX. The Alberta Bureau of Statistics projections for the 18-24 year old population are 11% higher in 1983 than those of Statistics Canada. In 1991 the Alberta Bureau of Statistics projections are 14% higher, and in 2001 they are 31% higher. The Alberta Bureau of Statistics projections are based on net migration assumptions which are significantly higher than those of Statistics Canada.

TABLE IX

COMPARISON OF PROJECTIONS FOR SCHOOL-AGE POPULATION GROUPS SELECTED YEARS 1977 TO 2001: ALBERTA (Thousands)

	5-11 YEAR OLDS		12-17 YEAR OLDS		18-24 YEAR OLDS	
YEAR	PROVINCIAL[1] PROJECTION	STATISTICS CANADA[2] PROJECTION (DIFFERENCE)	PROVINCIAL[1] PROJECTION	STATISTICS CANADA[2] PROJECTION (DIFFERENCE)	PROVINCIAL[1] PROJECTION	STATISTICS CANADA[2] PROJECTION (DIFFERENCE)
1977	232	0	235	0	278	- 6
1979	234	- 1	228	+ 2	300	- 11
1981	242	- 4	220	0	316	- 19
1983	258	- 14	221	- 6	333	- 33
1985	282	- 26	224	- 10	330	- 36
1987	309	- 40	229	- 14	317	- 34
1989	335	- 57	236	- 19	309	- 35
1991	357	- 72	254	- 28	307	- 36
2001	395	-114	348	- 90	389	- 91

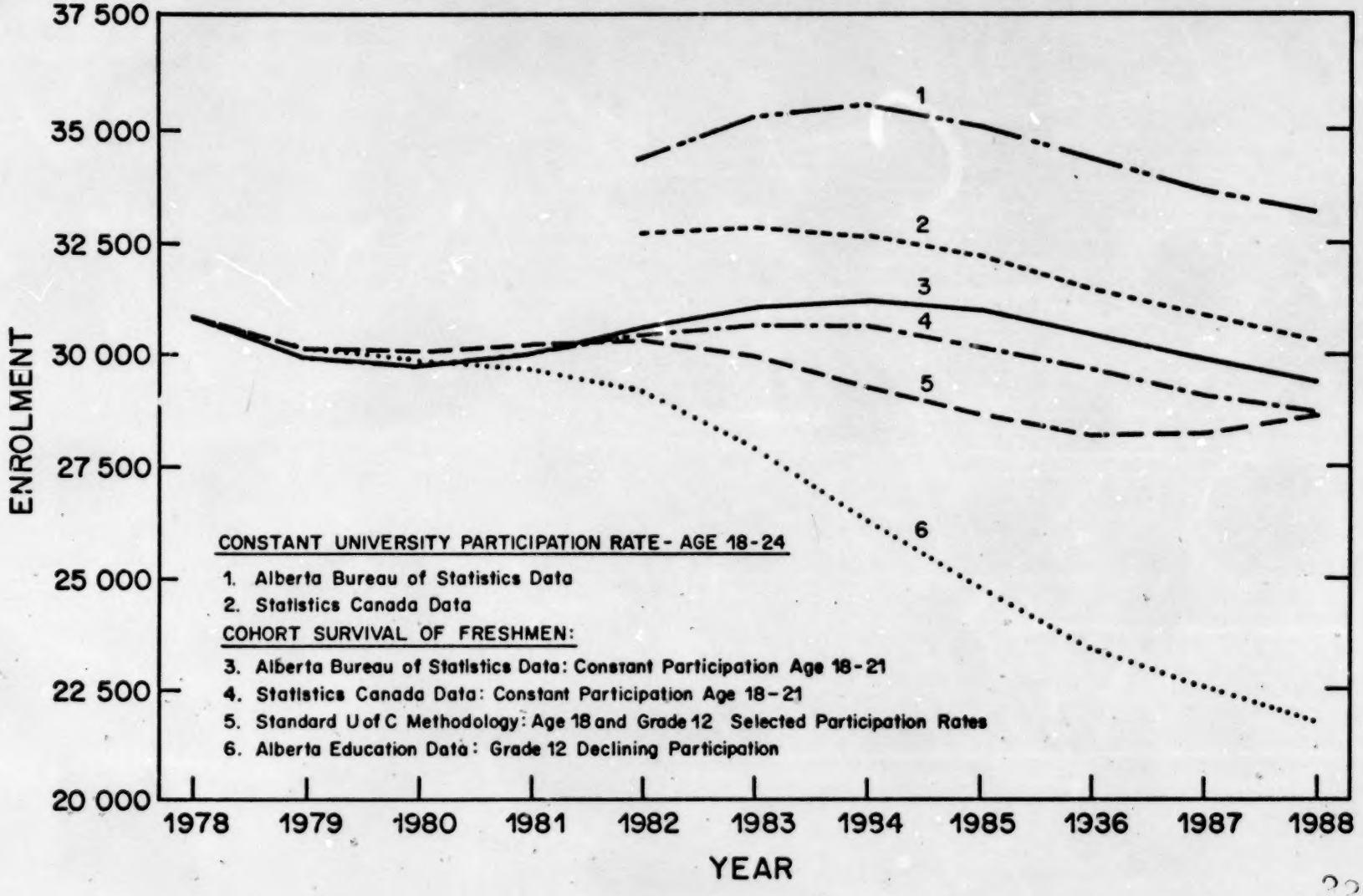
[1]Alberta Bureau of Statistics, "Population Projections Alberta 1977-2006," (pre-publication release) (Edmonton: Government of the Province of Alberta, July 1978). Projection Series #4.

[2]The Class of 2001, p. 127. Projection #3.

Enrolment Projections -- Alberta Universities

To illustrate the potential impact of the demographic trends for different population cohorts discussed earlier, projected full-time university enrolments are provided in Figure 2 and Table X. Six projections

FIGURE 2
PROJECTED FULL-TIME ENROLMENT – ALBERTA UNIVERSITIES



are provided for the period between 1979 and 1988. Alberta Advanced Education and Manpower does not make public its most current projections of postsecondary enrolments.[1] The projections in this analysis are derived by standard methodologies designed to illustrate two categories of projections; central, and limiting cases.

Projections 3, 4, and 5 represent central cases resulting from the application of standard cohort survival methodologies. The three central projections are essentially flat over a ten year period and only diverge to any significant degree during a five year period from 1983 to 1987. Projection 5, which is at its lowest point in 1986, is only 8.5% below the current enrolment of 30 847. The central projections suggest a much flatter trend for potential university enrolments than one might assume by simply examining the trends suggested by the population projections for the province presented in The Class of 2001.

Projections 1, 2, and 6 demonstrate features of the population age profile and limiting cases of future student enrolments resulting from participation rate trends. To better understand the differences between the various projections and the methodologies, Projection 6 is examined first. It represents the "worst case" and is based on the assumption that participation rates for the Alberta Grade 12 cohort will continue to decline at the same rate experienced between 1970 and 1978, thereby resulting in successively smaller freshman classes. This projection illustrates the impact of enrolments already in the universities. The full impact of smaller freshman enrolments is not immediately felt because initially there are three classes still in the universities: the first year classes of 1976, 1977, and 1978. It is not until these classes have graduated that the rate of decline in total enrolment accelerates. Hence

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[1] Most recent published projections by Alberta Advanced Education and Manpower, Planning Secretariat appeared in, "Information Paper Six: Population, Manpower, and Enrolment Projections" Appendix 1, Report of the Task Force to Review Student's Contributions to the Costs of Post Secondary Education, May 1978. Projections were based on fall 1976 enrolment data.

1982 marks the point at which the total enrolment begins its steepest decline. By contrast, the "best case" is illustrated by Projections 1 and 2, which are based on the application of the current participation rate of the 18-24 year olds to the population projections provided by Statistics Canada and the Alberta Bureau of Statistics. Projections 1 and 2 show the limits enrolment could reach assuming that university enrolments reflect long-range population trends. They begin in 1982 because short-term enrolments depend primarily on students already in the universities.

Projections 3 and 4 are methodologically sound representations of the impact of the population cohorts discussed above. These two projections are based on the Statistics Canada and Alberta Bureau of Statistics projections of the 18-21 population cohort and are consistent with the notion that changes in the population or participation rate will not be immediately reflected in total university enrolment with the same degree of magnitude suggested by Projections 1 and 2. Projection 5 represents the application of the standard University of Calgary methodology. It differs primarily from that used in Projections 3 and 4 by considering a more selective cohort for projection of freshman enrolment. Freshman enrolment is derived by averaging different projections based on Alberta Grade 12 and the 18 year old cohort.

TABLE X

PROJECTED FULL-TIME ENROLMENT IN ALBERTA UNIVERSITIES[1]

	PROJECTION					
YEAR	1	2	3	4	5	6
1979	-	-	29 900	30 000	30 100	30 200
1980	-	-	29 800	29 800	30 000	29 900
1981	-	-	30 000	30 000	30 200	29 600
1982	34 500	32 700	30 600	30 400	30 400	29 100
1983	35 300	32 800	31 000	30 600	29 900	27 900
1984	35 500	32 600	31 200	30 600	29 300	26 400
1985	35 100	32 100	31 000	30 200	28 600	34 800
1986	34 400	31 500	30 500	29 600	28 200	23 500
1987	33 700	30 900	29 900	29 000	28 300	22 500
1988	33 100	30 400	29 500	28 600	28 600	21 800

[1]Office of Institutional Research, The University of Calgary based on population data provided by Alberta Advanced Education and Manpower (Edmonton, Alberta); Statistics Canada (Ottawa, Ontario); Alberta Department of Education (Edmonton, Alberta); Alberta Bureau of Statistics, Government of the Province of Alberta (Edmonton, Alberta).

Labor Force and Educational Attainment

Data provided in Statistics Canada's Out of School - Into the Labour Force shows that educational attainment trends in potential labor force entrants exhibit the same characteristics of the population wave phenomenon discussed in Appendix "A". During the last decade there has been a dramatic increase in the number of labor force entrants with post-secondary level training. This trend is projected to peak in 1981, followed by a slight decline in the mid-1980's. The trend for labor force entrants with elementary-secondary training follows a similar pattern peaking five years earlier in 1976, followed by a sharper rate of decline during the mid-1980's. Almost all of the anticipated decline in the labor force projected for the 1980's will occur among those with elementary-secondary level of training. The postsecondary cohort will remain relatively constant. In the long term, the low fertility rates experienced in the 1960's and 1970's will result in a decline of the postsecondary output across Canada, though the trend will vary by province. Table XI provides historical and projected data on the number of labor force entrants by level of educational attainment.

TABLE XI

PERCENTAGE OF POTENTIAL LABOR FORCE ENTRANTS
FROM THE EDUCATION SYSTEM
BY LEVEL OF SCHOOLING
1966 TO 1986[1]
CANADA

	ELEMENTARY SECONDARY			POST-SECONDARY COMPLETED							
YEAR	SOME	COMPLETED SECONDARY	PERCENT TOTAL	SOME	CERTIFICATE OR DIPLOMA	BACHELOR'S AND FIRST PROFESSIONAL	MASTER'S	DOCTORATE	PERCENT TOTAL COMPLETED	PERCENT TOTAL POST-SECONDARY	GRAND TOTAL
1966	52.6	28.8	81.4	5.9	5.8	6.0	0.8	0.1	12.7	18.6	100
1976	43.4	20.7	64.1	19.0	6.8	8.7	1.2	0.2	16.9	35.9	100
1981	41.4	21.4	62.8	18.8	7.8	9.1	1.3	0.2	18.4	37.2	100
1986	39.5	18.6	58.1	21.2	8.1	10.7	1.7	0.2	20.7	41.9	100

[1] Out of School - Into the Labour Force, p. 56.

Employment and Educational Attainment

Historically, there has been an inverse relationship between educational attainment and unemployment. This has been true both of the entire labor force as well as new entrants. Statistics Canada suggests that this trend may not persist as the proportion of the labor force with postsecondary training increases. In 1961, 22% of the labor force had postsecondary training, in 1971 the proportion was roughly 30%, and is projected to increase to between 34% and 40% in the mid-1980's. If the number of jobs requiring some degree of postsecondary training do not grow in proportion to the level of educational attainment of the labor force, postsecondary graduates will encounter greater difficulty in acquiring employment similar to that obtained by their counterparts in the 1960's.[2] Labor market expansion in terms of educational requirements will vary by province and it is reasonable to assume that growth in Alberta resource-related business and industry will create further demand for university level training. Table XII shows the number of university level degrees granted in Canada from 1960 to 1977 by degree type and percentage of total. It is interesting to note that while there has been a growth in absolute numbers in each degree type the relative percent distribution has remained fairly constant.

TABLE XII

DEGREES AWARDED BY TYPE
CANADA
1960-61 TO 1976-77[1]

	PERCENTAGE			
YEAR	BACHELOR AND FIRST PROFESSIONAL	MASTER'S DEGREE	DOCTORATE	TOTAL NUMBER
1960-61	88.7	10.0	1.3	22 331
1962-63	88.7	9.8	1.5	28 115
1964-65	88.9	9.6	1.5	37 202
1966-67	87.7	10.7	1.6	49 271
1968-69	87.0	11.1	1.9	62 838
1970-71	85.6	12.3	2.1	78 363
1972-73	84.9	12.8	2.3	83 255
1974-75	86.2	12.0	1.8	93 645
1976-77	86.0	12.3	1.7	101 269

[1] Education Science and Culture Division, From the Sixties to the Eighties; A Statistical Portrait of Canadian Higher Education (Ottawa: Statistics Canada, February 1, 1979).

[2] Out of School - Into the Labour Force, pp. 46 and 47.

Occupational Demand in Alberta

Limitations of Available Data

The intent of this discussion is to concentrate primarily on those occupations which require some level of postsecondary training. The data provided in the Summary of Canadian Occupational Forecast (COFOR) Model Results for Alberta, 1975-1982, published by the Alberta Advanced Education and Manpower Planning Secretariat, do not classify occupations by level of educational training required, nor do they specify the discipline required. For many occupations it is extremely difficult to specify discipline requirements other than very general categories. It is also difficult to specify the level of postsecondary training both in terms of level, i.e., university, college, technical institute, and degree of completion. The Planning Secretariat plans to undertake a study to relate the specific components of educational output to occupational demand in the province, but at this point in time little information is available. The only study which links unemployment rates by discipline is one prepared by Statistics Canada for the Province of Ontario[3] based on 1975 college and university graduates. Unemployment in the Ontario sample varied substantially by discipline. Unemployment tended to be higher among bachelor's degree holders than for graduates of colleges of applied arts and technology. University graduates of the health disciplines, business, engineering, architecture, education, mathemtics, and science had the lowest rate of unemployment while graduates in the humanities, social sciences, fine arts, and languages were substantially higher. In fact, the latter disciplines were above that of the unemployment rate for the 15-24 year old group as a whole.[4]

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[3]Survey of 1975 Ontario College and University Graduates conducted by Statistics Canada for the Ontario Ministry of Colleges and Universities, cited in Out of School - Into the Labour Force, Statistics Canada, July 1978.

[4]Out of School - Into the Labour Force, p. 36.

Occupational Demand

The Planning Secretariat of Alberta Advanced Education and Manpower in its forecast of occupational demand in the province limits the scope of its projection to the period from 1975 to 1982, which coincides with the projected peak for the 18-24 year old population. Total Alberta employment in all occupations is forecast to increase by 53.9% during the period 1975 to 1982. The increase is based on two components, new positions and replacement due to attrition from existing positions. New positions will increase during the forecast period by approximately 40% while replacement will account for an increase of 13.9%. In absolute numbers this means an increase in the gross occupational requirement of 407 625 during the period 1975 to 1982 above the 756 000 jobs existing in 1975.

The available data on occupational demand in Alberta, though lacking definition in terms of degree requirements, suggests certain definite trends. The medical and health professions show the greatest increase in demand over the 1975 level of employment. These occupational categories, especially the medical component, are those least affected by demographic trends since university medical programs have enrolment limits. Other categories showing substantial increases in demand over the forecast period are managerial and administrative, natural sciences, engineering and mathematics, and social sciences. Those general occupational categories with relatively low increase in demand are teaching and farming. Table XIII provides a breakdown of the components of demand for those occupational categories which exhibit either high or low demand.

Among the general categories which exhibit a high increase in demand, a more detailed breakdown within categories shows interesting differences between specific occupations in related fields (see Table XIV); within the natural sciences increased demand for geologists is projected at 61.6%, while the increase for biologists, chemists, and physicists ranges from 6% to 15% lower. In the engineering disciplines there are also wide variations. It is also interesting to note that a more detailed breakdown of the teaching occupations suggests that the percentage increase in opportunities for university level teaching exceeds that of elementary and secondary teaching but in terms of absolute numbers needed the latter group's requirements are substantially greater.

TABLE XIII

FORECAST OF OCCUPATIONAL REQUIREMENTS
ALBERTA 1975-1982
SELECTED OCCUPATIONAL CATEGORIES[1]

OCCUPATIONAL CATEGORIES	DEMAND 1975	DEMAND 1982	REPLACEMENT 1975-82	TOTAL DEMAND 1975-82	PERCENT OF 1975 DEMAND
Managerial and Administrative	32 030	43 902	10 412	22 284	70
Natural Sciences, Engineering, Mathematics	23 612	31 714	5 373	13 475	57
Social Sciences	7 131	10 160	1 683	4 712	66
Teaching	30 996	37 293	7 478	13 775	44
Medicine and Health	36 614	54 640	8 113	26 139	71
Arts and Recreation	6 033	8 888	1 144	3 999	66
Farming OCCS.	97 889	93 828	22 496	18 435	19

[1]Planning Secretariat, Summary of Canadian Occupational Forecast (COFOR) Model Results for Alberta 1975-1982 (Edmonton: Alberta Advanced Education and Manpower, March 1976), pp. 4-9.

TABLE XIV

FORECAST OF OCCUPATIONAL REQUIREMENTS
ALBERTA 1972-1982
SELECTED OCCUPATIONS[1]

OCCUPATIONAL CATEGORIES	DEMAND 1975	DEMAND 1982	REPLACEMENT 1975-82	TOTAL DEMAND 1975-82	PERCENT OF 1975 DEMAND
Chemists	568	728	104	264	46
Geologists	2 222	2 934	657	1 369	62
Physicists	46	58	9	21	46
Meteorologists	108	156	28	76	70
Biologists	356	492	50	186	52
Engineers					
Civil	1 980	2 709	460	1 189	60
Electrical	1 149	1 491	266	608	53
Industrial	711	945	169	403	57
Mechanical	802	1 050	185	433	54
Petroleum	1 112	1 456	268	612	55
Nuclear	5	6	-	1	20
University Teaching	2 594	3 072	823	1 301	50
Elementary and Secondary Teaching	23 609	28 106	5 386	9 883	42

[1]Summary of Canadian Occupational Forecast (COFOR) Model Results for Alberta 1975-1982, pp. 25-29.

APPENDIX A

CANADIAN POPULATION TRENDS

Canadian Population Trends

Population Waves

The total population of Canada is projected to increase by 13.5% during the period 1976 to 1986. However, more importantly, the composition of the population will shift as a direct result of fluctuations in the fertility rate during the last three decades. The annual number of live births peaked in 1959, followed by a progressive decline in the fertility rate during the 1960's, reaching a low point in 1973. Between 1973 and 1976, the fertility rate began to climb again, but declined slightly again in 1977. If a constant fertility rate is assumed for the decade of the 1980's, annual live births will increase slowly to a peak in 1984, but this peak will still be substantially below the level reached in 1959. This phenomenon is referred to as "population waves" and is discussed in detail in both The Class of 2001 and Out of School - Into the Labour Force in terms of its impact on the Canadian educational system.

TABLE I

ANNUAL LIVE BIRTHS (CANADA)[1]
SELECTED YEARS

1959	479 000
1973	343 000
1976	365 000
1984	412 000 (projected)

[1] The Class of 2001, p. 19.

TABLE II

PERCENT DISTRIBUTION OF POPULATION
SELECTED AGE GROUPS

AGE GROUP	ACTUAL 1971	PROJECTED 1986
4-17	29.0	20.1
25-44	25.1	33.1

[1] Out of School - Into the Labour Force, p. 4.

Demographic Trends in School Age Population (Canada)

As the post-war baby boom matures, each successive age group increases temporally followed by a decline then a further but smaller increase. The impact of population waves will be first felt in the elementary and secondary school age population. The wave in the number of 6-13 year olds (elementary school cohort) peaked in 1971, and is projected to decline by 22% in the early 1980's, and gradually increase again by the mid-1990's. The rate of increase will be such that the total for the age group will fall substantially short of the 1971 peak. Similarly, the 14-17 year old age group (secondary school cohort) will follow the same progressive pattern with a time-lag due to past fluctuations in the fertility rate. This age group reached its peak in 1977 and is projected to decline by 26% in the late 1980's, and then gradually increase until the turn of the century. Since elementary and secondary enrolment is compulsory the shifts experienced in the corresponding age group will directly impact enrolments.

Demographic trends for the 18-24 year old population which provide the base for postsecondary enrolments require special consideration. This group is expected to increase at a rate of approximately 1.2% a year, reaching a peak in 1982, with a marked decline until the mid-1990's, followed by a gradual increase as we near the turn of the century.

APPENDIX B

SUMMARY OF
THE CLASS OF 2001

SUMMARY OF

THE CLASS OF 2001:
The School-Age Population Trends
and Implications, 1961 to 2001

W. Clark, M. S. Devereaux, and
Z. Zsigmond
Statistics Canada, February 1979

Statistics Canada has endeavored in The Class of 2001 to expand on the demographic trends and social issues discussed in its earlier works such as Out of School - Into the Labour Force. The principle advantage of the latest document is its detailed presentation of alternative projections of various age groups for the individual provinces in Canada. Like the earlier work Out of School - Into the Labour Force, the notion of population waves is examined, but the treatment in The Class of 2001 allows one to assess more precisely the impact of these fluctuations on the various levels of school systems within a province. There is also the advantage that one can better understand the regional composition of the national projections.

Four different projections are offered at both the national and provincial level for the three age groups which traditionally impact the educational system: Elementary (5-13 years of age); Secondary (14-17 years of age); Postsecondary (18-24 years of age). The national projections reflect differing fertility assumptions, especially for the elementary and secondary age groups projected to the year 2001. Projections at the national level for the 18-24 year old group are not influenced by differing fertility assumptions until the mid-1990's. The principal factor affecting provincial projections for the 18-24 year old population from 1976 to the mid-1990's is the annual rate of interprovincial migration and international immigration. Detailed information is provided on the historical trends for interprovincial migration along with the migration assumptions which form the bases for the various provincial projections. Of particular interest is the information on interprovincial migration of those in the 15 years of age and under groups which will impact long-range projections for the postsecondary age group.

APPENDIX C

SUMMARY OF
OUT OF SCHOOL - INTO THE LABOUR FORCE

SUMMARY OF

OUT OF SCHOOL - INTO THE LABOUR FORCE:
Trends and Prospects for enrolment,
school leavers, and the labour force
in Canada - 1960's through the 1980's

Z. Zsigmond, C. Picot, W. Clark, and
M. S. Devereaux
Statistics Canada, July 1978

Out of School - Into the Labour Force addresses four main issues: Canadian demographic trends, enrolment at various levels of the educational system, educational output in the form of school leavers, and labor market prospects. Population projections are provided only at the national level for selected age groups representative of the various levels of the educational system; 6-13 year olds (elementary), 14-17 year olds (secondary), and 18-24 year olds (postsecondary).

The report ties its analysis to single population projection based on an assumption of a constant fertility rate of 1.80 and a net annual immigration of 100 000. Two alternative population projections are suggested but not discussed in detail. The alternative projections are based on different fertility assumptions. Three projections of elementary-secondary enrolment and four full-time postsecondary enrolment projections are developed. The three elementary-secondary projections are based on different fertility assumptions, while the postsecondary variations are based on different participation rate assumptions.

Projections of Canadian labor force growth are made both for three distinct age groups and two levels of educational attainment. The age groups 15-24, 25-44, and 45 and over, available to the labor force, are projected. A related set of projections forecasts the composition of the labor force in terms of educational attainment in two categories: those with secondary graduation or less, and those labor force entrants who have completed postsecondary training or have some training at this level. The statistics show that there has been a substantial shift in the composition of the labor force in terms of education training during the period from 1966 to 1976. In 1966, 18.5% of the labor force entrants had postsecondary

training; in 1976, the proportion grew to 35.9%. During the period from 1976 to 1986 this shift is expected to continue, but at a much slower rate--projected at 42.3% in 1986. There has been no attempt in the document to match output of the educational system with demand. With a greater proportion of the labor force entrants projected with some postsecondary training there is a scarcity of information on the existing or potential demand for this level of training. Coupled with projections of the size of the labor force are statistics dealing with unemployment rates by major discipline categories and level of educational attainment. Again, these statistics are for Canada as a whole, and do not provide provincial breakdowns.

A comparative index of labor force growth and unemployment rates for Canada and selected industrialized countries shows that while Canada has the highest rate of labor force growth it also has the highest rate of unemployment among the countries compared.

APPENDIX D

SUMMARY OF CANADIAN OCCUPATIONAL FORECAST (COFOR) MODEL RESULTS FOR ALBERTA, 1975-1982

SUMMARY OF

CANADIAN OCCUPATIONAL FORECAST (COFOR) MODEL RESULTS FOR ALBERTA, 1975-1982

Planning Secretariat, Alberta Advanced Education and Manpower, March 1976

This document is essentially a compilation of statistical tables which present the results of the Canadian Occupational Forecast (COFOR) Model for the period 1975 to 1982 in Alberta. Net change in occupational demand is defined in terms of two components: demand increase representing new jobs created in a particular occupation, and employment opportunities resulting from attrition. Attrition (replacement) includes death, retirement, or departure from existing jobs. A major shortcoming of the document is the lack of any indication of the level of educational attainment or certification required by various occupations. For this reason, it is questionable whether the occupational forecasts in their present form provide sufficient information to match output of the Alberta educational system at various levels with specific occupational demand.

Occupations are classified by a four digit code specified by the Canadian Classification and Dictionary Occupations (CCDO). The tables are organized into three levels of aggregation based on the CCDO code. The first group of tables represents the highest level of aggregation based on the first two digits of the code. Characteristic of this level of aggregation, the occupations are sector oriented such as service, mining, medicine and health, farming, forestry, and product fabrication, etc. The second level of aggregation based on the first three digits of the code are more profession and trade oriented detailing such occupations as nursing, physical scientist, university teaching, clerical, etc. The third or lowest level of aggregation specifies in more detail the various positions within a trade or profession. For example, occupations in the physical sciences are disaggregated into chemists, geologists, physicists, meteorologists, etc. This lowest level of aggregation incorporates all four digits of the CCDO code.

Within each of the three sets of tables there are three types of data provided. The first is a summary of occupational requirements for the period 1975-1982 with the net increase broken down into its components (demand increase and replacement). The second set of data displays the level of demand in each of the intervening years between 1975 and 1982. The third set groups occupations according to rate of growth in total demand.